

(c) REMARKS

The claims are 17-22 with claim 17 the sole independent claim. Claim 17 has been amended to clarify the intended invention and reconsideration of the claims is expressly requested. Support for amended claim 17 is found, inter alia, on page 6, page 7, pages 12 and 13, page 38, lines 1-9, page 38, line 22 to page 39, line 4, Table 1 and Figs. 1 and 2.

Claims 17 and 22 were rejected as anticipated by Nakatani '917. Claims 18-20 were rejected as obvious over Nakatani '917 in view of Igarashi '571. Claim 21 was rejected as obvious over Nakatani and Igarashi in view of Kieser '641. The grounds of rejection are respectfully traversed.

Initially, claim 17 has been amended to provide that a gas gate introducing means prevents diffusion of p-type dopant in the fourth chamber into the third chamber. In addition, the apparatus includes at least four chambers as claimed, in order, to form a product having a n-type, non-crystalline i-type, microcrystalline i-type and p-type-layer construction exhibiting good grating consistency, good current-voltage characteristics and good photovoltaic conversion efficiency by continuous mass production.

In the present invention, a gas gate introducing means is provided between the third and fourth chambers, i.e., between the microcrystalline i-type and p-type layer forming chambers. However, in Nakatani, buffer chamber 13, provided between reaction chambers 1 and 2, is not a gas gate because Nakatani discloses that the buffer chamber, as a narrow path, cannot prevent diffusion of a p-type dopant from the p-type layer-forming reaction chamber into the i-type layer-forming reaction chamber. Therefore, Nakatani has no concept of employing a gate gas introducing means in the buffer chamber.

Nakatani discloses that separators 11 have gaps 14 therebetween. The gaps 14 were formed to allow the passage of a reaction gas. Nakatani also teaches that in the system of Fig. 1, slight amounts of gas usually penetrate the second reaction chamber through buffer chamber 13 and that this is unavoidable. Nakatani further teaches regarding Fig. 4 that even with separators gas-containing boron from the p-type reactor is accumulated in the i-type layer. Furthermore, because the separator 11 of Nakatani is separated from a high frequency applying electrode, the separator of Nakatani is different from the fin-shaped electrode.

Finally, it is clear from the drawings that a portion of Nakatani for supplying a raw material gas into the chamber is not shielded. Therefore, such portion of Nakatani is different from the portion of the present invention (claim 22) for supplying a raw material gas into the chamber and having a member for shielding the substrate from the flow of the raw material gas.

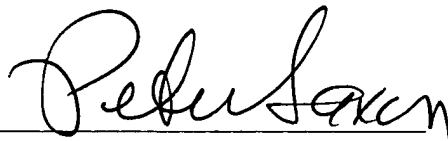
In addition, Nakatani fails to teach use of four chambers to provide, in order, a n-type layer, a non-crystalline i-type layer (amorphous), a microcrystalline (μc) i-type layer and a p-type layer. As noted in Nakatani column 1, lines 15-25 and column 8, lines 31-40 and lines 54-62, typically, a p-i-n or n-i-p product is formed in the three chambers provided, where the i-type layer is typically amorphous. As noted in column 13, the amorphous i-type layer can have a peripheral portion microcrystallized and a central portion which is amorphous or can have a microcrystalline i-type layer substituted for the amorphous i-type layer. However, there is no disclosure of employing four chambers to provide the instant four-layered product having both an amorphous i-type layer and a separate microcrystalline layer. There is no teaching in Nakatani of an apparatus for

providing such a product nor the benefits thereof as shown in the instant Comparative Examples.

Wherefore, it is requested that the claims be allowed and that the case be passed to issue.

Applicants' undersigned attorney may be reached in our New York office by telephone at (212) 218-2100. All correspondence should continue to be directed to our below listed address.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Peter Saxon", written over a horizontal line.

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